UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/085,606	02/26/2002	Michael Karl Gschwind	YOR920020001US1	8683

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EXAMINER
MEONSKE, TONIA L

ART UNIT	PAPER NUMBER
2183	

DATE MAILED: 08/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/085,606	GSCHWIND ET AL.
	Examiner	**Art Unit**	
	Tonia L Meonske	2183	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>19 February 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-27</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-27</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>26 February 2002</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>2/19/03</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Specification

1.   The title of the invention is not descriptive. A new title is required that is clearly

indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed
> in the United States before the invention by the applicant for patent or (2) a patent granted on an application for
> patent by another filed in the United States before the invention by the applicant for patent, except that an
> international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this
> subsection of an application filed in the United States only if the international application designated the United
> States and was published under Article 21(2) of such treaty in the English language.

3.   Claims 1-6, 9, 11, 12, 14-19, 22, 24, 25, and 27 are rejected under 35 U.S.C. 102(e) as

being clearly anticipated by Hum et al., US Patent 6,594,730.

4.   Referring to claim 1, Hum et al. have taught in a processor, an apparatus for issuing

instructions, comprising:

       a.   a classification logic adapted for prioritizing instructions in relation to one another

and sorting said instructions in a number of priority categories (abstract, column 2, lines

12- 64, column 3, lines 13-51);

       b.   a plurality of instruction queues, wherein said plurality of said queues matches

said number of said priority categories, and wherein each of said queues adapted to

receive only one of said priority categories of said instructions from said classification

logic, whereby said queues having same priority categories as said instructions (abstract,

column 2, lines 12- 64, column 3, lines 13-51, Figure 1, elements 145, 150, 160, 170, and

190); and

c.   an issue logic operably coupled to said plurality of instruction queues and

selecting from which of said queues to dispatch said instructions for execution, wherein

said issue logic has been designed to be cognizant of said priority categories of said

queues (abstract, column 2, lines 12- 64, column 3, lines 13-51, Figure 1, element 200).

5.   Referring to claim 2, Hum et al. have taught the apparatus for issuing instructions of

claim 1, as described above, and wherein said apparatus forms part of an in-order instruction

issue processor architecture (column 2, lines 12-21).

6.   Referring to claim 3, Hum et al. have taught the apparatus for issuing instructions of

claim 1, as described above, and wherein said apparatus forms part of an out-of-order instruction

issue processor architecture (column 2, lines 12-21).

7.   Referring to claim 4, Hum et al. have taught the apparatus for issuing instructions of

claim 1, as described above, and wherein said plurality of instruction queues consist of two

queues, a high priority queue (Figure 1, elements 140, 150, 160, and 170) and a low priority

queue (Figure 1, element 190).

8.   Referring to claim 5, Hum et al. have taught the apparatus for issuing instructions of

claim 1, as described above, and wherein said instructions sorted in said number of priority

categories by said classification logic comprise cloned instructions (column 2, lines 12- 64, The

prefetch instructions are cloned from future instructions to be executed in order to prefetch

upcoming needed data into the cache.).

9.   Referring to claim 6, Hum et al. have taught the apparatus for issuing instructions of

claim 5, as described above, and wherein said cloned instructions and corresponding unmodified

instructions from which said cloned instructions have been derived are found in different ones of

said priority category queues (Figure 1, Regular instructions are stored in elements 140, 150,

160, and 170, and prefetch instructions, which have a lower priority, are stored in element 190).

10.   Referring to claim 9, Hum et al. have taught the apparatus for issuing instructions of

claim 1, as described above, and wherein said prioritizing of said instructions is based on a

probability for memory miss (column 4, lines 12-50, column 5, lines 50-57).

11.   Referring to claim 11, Hum et al. have taught the apparatus for issuing instructions of

claim 1, as described above, and wherein said apparatus is designed for prioritizing and issuing

said instructions in a dynamic manner (column 2, lines 12- 64, column 3, lines 13-51, The

second arbiter, element 200, is adapted to dynamically disregard requests received from the

prefetch queue when the queue is congested.).

12.   Referring to claim 12, Hum et al. have taught the apparatus for issuing instructions of

claim 1, as described above, and wherein said apparatus further comprising a predictor unit

operably coupled to said classification logic, wherein said predictor unit identifies performance-

critical instructions (column 2, lines 12- 64, A prefetch instruction is not a performance critical

instructions and as such is identified as a lower priority instruction.).

13.   Claim 14 does not recite limitations above the claimed invention set forth in claim 1 and

is therefore rejected for the same reasons set forth in the rejection of claim 1 above.

14.   Claim 15 does not recite limitations above the claimed invention set forth in claim 2 and

is therefore rejected for the same reasons set forth in the rejection of claim 2 above.

15.   Claim 16 does not recite limitations above the claimed invention set forth in claim 3 and

is therefore rejected for the same reasons set forth in the rejection of claim 3 above.

16.   Claim 17 does not recite limitations above the claimed invention set forth in claim 4 and

is therefore rejected for the same reasons set forth in the rejection of claim 4 above.

17.   Claim 18 does not recite limitations above the claimed invention set forth in claim 5 and

is therefore rejected for the same reasons set forth in the rejection of claim 5 above.

18.   Claim 19 does not recite limitations above the claimed invention set forth in claim 6 and

is therefore rejected for the same reasons set forth in the rejection of claim 6 above.

19.   Claim 22 does not recite limitations above the claimed invention set forth in claim 9 and

is therefore rejected for the same reasons set forth in the rejection of claim 9 above.

20.   Claim 24 does not recite limitations above the claimed invention set forth in claim 11 and

is therefore rejected for the same reasons set forth in the rejection of claim 11 above.

21.   Claim 25 does not recite limitations above the claimed invention set forth in claim 12 and

is therefore rejected for the same reasons set forth in the rejection of claim 12 above.

22.   Referring to claim 27, Hum et al. have taught a program storage device, readable by a

machine, tangibly embodying a program of instructions executable by the machine to perform

method steps for issuing instructions as recited in claim 14 (Figure 1, element 210).

23.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
sale in this country, more than one year prior to the date of application for patent in the United States.

24.   Claims 1, 10, 13, 14, 23, and 26 are rejected under 35 U.S.C. 102(b) as being clearly

anticipated by Bain, Jr. et al., US Patent 4,829,425.

25.   Referring to claim 1, Bain, Jr. et al. have taught in a processor, an apparatus for issuing

instructions, comprising:

>   a.   a classification logic adapted for prioritizing instructions in relation to one another
>
>   and sorting said instructions in a number of priority categories (column 15, lines 30-40,
>
>   Low priority instructions are classified in the low priority queue and the high priority
>
>   instructions are classified in the high priority queue.);
>
>   b.   a plurality of instruction queues, wherein said plurality of said queues matches
>
>   said number of said priority categories, and wherein each of said queues adapted to
>
>   receive only one of said priority categories of said instructions from said classification
>
>   logic, whereby said queues having same priority categories as said instructions (column
>
>   15, lines 30-40, Low priority queu e receives low priority instructions and the high
>
>   priority queue receives high priority instructions.); and
>
>   c.   an issue logic operably coupled to said plurality of instruction queues and
>
>   selecting from which of said queues to dispatch said instructions for execution, wherein
>
>   said issue logic has been designed to be cognizant of said priority categories of said
>
>   queues (column 15, lines 30-68).

26.   Referring to claim 10, Bain, Jr. et al. have taught the apparatus for issuing instructions of

claim 1, as described above, and wherein said apparatus is designed for prioritizing and issuing

said instructions in a static manner (column 15, lines 30-40, The programmer provides a static

channel number, either 14 or 15.).

27.   Referring to claim 13, Bain Jr., et al. have taught the apparatus for issuing instructions of

claim 1, wherein said classification logic further adapted for receiving preannotated instructions,

wherein said instructions have been preannotated during compilation time and said

preannotations indicate said priority categories (column 15, lines 30-40).

28.   Claim 14 does not recite limitations above the claimed invention set forth in claim 1 and

is therefore rejected for the same reasons set forth in the rejection of claim 1 above.

29.   Claim 23 does not recite limitations above the claimed invention set forth in claim 10 and

is therefore rejected for the same reasons set forth in the rejection of claim 10 above.

30.   Claim 26 does not recite limitations above the claimed invention set forth in claim 13 and

is therefore rejected for the same reasons set forth in the rejection of claim 13 above.

Claim Rejections - 35 USC § 103

31.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

32.   Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bain, Jr.

et al., US Patent 4,829,425, in view of Wulf et al., US Patent 6,154,826.

33.   Referring to claim 7, Bain Jr. et al. have taught the apparatus for issuing instructions of

claim 1, as described above. Bain Jr. et al. have not taught wherein said prioritizing of said

instructions is based on said instructions being scalar instructions or vector instructions. Wulf et

al. have taught wherein said prioritizing of said instructions is based on said instructions being

scalar instructions or vector instructions (column 2, line 60-colum 3, line 37) for the desirable

purpose of avoiding memory bottlenecks. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the prioritizing of the instructions in Bain Jr. et al. based on said instructions being scalar instructions or vector instructions, as taught by Wulf et al., for the desirable purpose of avoiding memory bottlenecks (column 2, line 60-colum 3, line 37).

34.   Claim 20 does not recite limitations above the claimed invention set forth in claim 7 and is therefore rejected for the same reasons set forth in the rejection of claim 7 above.

35.   Claims 8 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hum et al., US Patent 6,594,730, in view of Taniani et al., US Patent 5,655,114.

Referring to claim 8, Hum et al. have taught the apparatus for issuing instructions of claim 1, as described above. Hum et al. have not specifically taught wherein said prioritizing of said instructions is based on a conditionality of branching. However, Taniani et al. have taught prioritizing of said instructions is based on a conditionality of branching (column 3, lines 46-52, column 11, line 35-column 12, line 28) to minimize useless prefetch operations. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the prioritizing of Hum et al. be based on a conditionality of branching, as taught by Taniani et al., for the desirable purpose of minimizing useless prefetch operations (column 3, lines 46-52, column 11, line 35-column 12, line 28).

36.   Claim 21 does not recite limitations above the claimed invention set forth in claim 8 and is therefore rejected for the same reasons set forth in the rejection of claim 8 above.

Conclusion

37.   Any inquiry concerning this communication or earlier communications from the
examiner should be directed to Tonia L Meonske whose telephone number is (703) 305-3993.
The examiner can normally be reached on Monday-Friday, 8-4:30.

38.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Eddie P Chan can be reached on (703) 305-9712. The fax phone number for the
organization where this application or proceeding is assigned is 703-872-9306.

39.   Information regarding the status of an application may be obtained from the Patent
Application Information Retrieval (PAIR) system. Status information for published applications
may be obtained from either Private PAIR or Public PAIR. Status information for unpublished
applications is available through Private PAIR only. For more information about the PAIR
system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR
system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RICHARD L. ELLIS
PRIMARY EXAMINER

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